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09/924,905	08/08/2001	John E. Gilmour	COMPIX-26	2857
7590 09/20/2005			EXAMINER	
Ansel M. Schwartz Suite 304 201 N. Craig Street Pittsburgh, PA 15213			DAVIS, CYNTHIA L	
			ART UNIT	PAPER NUMBER
			2665	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/924,905

Applicant(s)

GILMOUR ET AL.

Examiner

Cynthia L. Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim merely references a drawing figure, and does not point out what aspects of the drawing the applicant considers to be his invention.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 26, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Antonov.

Regarding claim 1, S core rings, each said core ring of which can be modeled as a set of nodes interconnected by links, where S greater than or equal to 4 and is an integer is disclosed in Antonov, figure 2, elements 24 (showing 4 rings). Each said core ring having at least N nodes, where N is greater than or equal to 4 and is an integer, each node/link configurable in terms of directing the medium from given source toward given destination is disclosed in figure 2, elements 10 and 12 (mid-switch routing elements and ring stations are nodes, see column 3, lines 33-40). Where each of the core rings is directly connected by means of spanning links, where k is greater than or equal to 2, so as to comprise a spanning ring to at least a second and a third of the

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other core rings is disclosed in figure 2, elements 15 (showing each ring being attached to two other rings). The combinations of core rings spanned by each core ring is such that there is a path comprised of links and nodes from each node on any core ring to any other node on any other core ring is disclosed in figure 2 (there are paths from every station to every other station via the various links in the topology).

Regarding claim 2, the first ring is connected to the second ring by at least one spanning ring in which the directionality of the medium flow is configurable is disclosed in Antonov, figure 2, elements 15 (the spanning links are configured to allow traffic to flow in both directions between the rings).

Regarding claim 3, the nodes of each ring are connected by core links in which the directionality of the medium flow is configurable is disclosed in Antonov, figure 2, elements 24 (the rings are configured to have the traffic flow between the nodes in a direction).

Regarding claim 4, the nodes of each ring are configurable so as to serve simultaneously as both input sources of the transferred medium or output destinations of the transferred medium is disclosed in Antonov, figure 2, elements 12 (the nodes have both input and output ports, allowing traffic to flow in and out of the nodes) an column 3, lines 38-41.

Regarding claim 26, a method for transferring a medium comprising the steps of: receiving the medium at first processing element of an array from configurable port of a first external device; transmitting the medium from a second configurable port of the first processing element to at least first configurable port of a second processing element of

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the array over first configurable link between the second configurable port of the first processing element and the first configurable port of the second processing element; sending the medium from a second configurable port of the second processing element to a second external device; receiving the medium from the second external device at first configurable port of a third processing element of the array; and transmitting the medium from a second configurable port of the third processing element to at least a first configurable port of a fourth processing element of the array over a second configurable link between the second configurable port of the third processing element and the first configurable port of the fourth processing, wherein each processing element is disposed in the array at a same location and each processing element of the array has multiple configurable links with at least two other processing elements of the array is disclosed in Antonov, figure 2 and column 3, lines 33-41 (the nodes in the ring, or array, transfer the medium from station port to station port over links that are configured to flow; the nodes are all linked to each other, are external to each other and contain processors).

Regarding claim 28, a module for processing signals comprising: at least a top base ring, intermediate base rings, and a bottom base ring, each ring having at least four nodes, the nodes of the top ring in communication with corresponding nodes of an immediately adjacent intermediate ring, the nodes of each intermediate base ring in communication with corresponding nodes of an intermediately adjacent intermediate ring, the nodes of the bottom ring in communication with corresponding nodes of an immediately adjacent intermediate ring, and the nodes of the top ring in communication

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with opposing nodes of the bottom ring is disclosed in Antonov, figure 2 (showing a network of interconnected rings).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5, 6, 9-13, and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antonov in view of Eslambolchi.

Regarding claim 5, the links being bi-directional regarding the medium flow is missing from Antonov. However, Eslambolchi discloses in column 2, lines 42-45, a ring with bi-directional flow. It would have been obvious to one skilled in the art at the time of the invention to use the bi-directional ring of Eslambolchi in the system of Antonov. The motivation would be to increase connectivity in the network.

Regarding claim 6, the medium includes data and wherein each node includes processor processing the data is disclosed in column 3, lines 38-41 (disclosing sending, receiving, and routing, or processing, of data packets).

Regarding claim 9, the medium includes photons (light energy/waves) and wherein each node includes a transmitter/receiver for flow of the said photons is missing from Antonov. However, Eslambolchi discloses in column 1, lines 11-14, an optical network in a ring formation (optical networks send and receive light energy). It would have been obvious to one skilled in the art at the time of the invention to use optical

signals in the system of Antonov. The motivation would be to send and receive telecommunications traffic (Eslambolchi, column 1, lines 13-14).

Regarding claim 10, a specified subset of nodes and links represent planar or multi-dimensional surfaces that facilitate the movement of objects in a multi-dimensional space from one location to another relative to both the sides of surfaces and relationships to nodes/links is disclosed in Antonov, figure 2, elements 24 (the rings are subsets of nodes and links, they move traffic from one location to another).

Regarding claim 11, each core ring has associated spanning links that span all other rings, or some subset thereof, that according to any specified ordering of the core rings are some power of any integer  $k$  greater than or equal to 2 distant from said core ring is disclosed in Antonov, column 3, lines 55-65.

Regarding claim 12, each core ring has associated spanning links that span to some subset of all other core rings such that any node of a core ring can be linked any other node of another core by means of a pre-determined number of hops to intermediate core rings is disclosed in Antonov, column 3, lines 55-65.

Regarding claim 13, nodes can be assigned to sub-rings of any prescribed sizes such that the sum of the sizes is less than or equal to the totality of nodes in the network and such that each sub-ring is disjoint regarding nodes and links from other sub-rings is disclosed in figure 5A and column 4, lines 62-65 (single failure zones are disjoint subrings).

Regarding claim 19, each core ring has associated spanning links that span to some subset of all other core rings such that any node of a core ring can be linked to

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any other node of another core by means of a pre-determined number of hops to intermediate core rings and where each hop corresponds a core ring to core ring distance that is a power of two is disclosed in Antonov, column 3, lines 55-65.

Regarding claim 20, each core ring has associated spanning links that span to some subset of all other core rings such that any node core ring can be linked to any other node of another core by means of a pre-determined number of hops to intermediate core rings and for which an algorithm to determine an appropriate combination of such hops can be based on a binary representation of the distance between the two core rings is disclosed in Antonov, column 3, lines 55-65.

Regarding claim 21, each core ring has associated spanning links that span some subset of all other core rings such that any node a core ring can be linked to any other node of another core by means of a pre-determined number of hops to intermediate core rings and for which an algorithm to determine an appropriate combination of such hops can be based on a function of  $k$  that expresses the distance between the two core rings is disclosed in Antonov, column 3, lines 55-65.

Regarding claim 22, the directionality of the medium flow over each of the links between nodes is pre-configured in terms of orientation is disclosed in Antonov, figure 2, elements 24 (the rings are configured to have the traffic flow between the nodes in a direction).

Regarding claim 23, the directionality of the medium flow over each of the links between nodes is pre-configured in terms of orientation and the nodes are partitioned into fixed categories according to whether they operate as conduits serving external



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devices as network input sources of medium and/or as network output destinations medium is disclosed in Antonov, figure 2, elements 24 (the rings are configured to have the traffic flow between the nodes in a direction) and elements 10 and 12 (there are two types of nodes in the rings, some are end switch routing elements, some are stations, see column 3, lines 33-38).

Regarding claim 24, the directionality of the medium flow over each of the links between nodes is pre-configured in terms of orientation and the nodes are partitioned into fixed categories according to whether they operate as conduits serving external devices as network input sources of medium and/or as network output destinations of medium and there is an orientation bias regarding input source to output destination medium flow is disclosed in Antonov, figure 2, elements 24 (the rings are configured to have the traffic flow between the nodes in a direction) and elements 10 and 12 (there are two types of nodes in the rings, some are end switch routing elements, some are stations, see column 3, lines 33-38; the types of nodes are grouped in the figure, which would bias the medium).

4. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antonov in view of Eslambolchi in further view of Ulug.

Regarding claim 7, the medium includes fluid and wherein each node includes a pump for pumping the fluid is missing from Antonov. However, Ulug discloses in column 26, lines 40-44, a network that has electricity flowing through it to represent data. A fluid is something capable of flowing (see Merriam-Webster's Dictionary, 10<sup>th</sup> ed., page 448, first definition of fluid). It would have been obvious to one skilled in the

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art at the time of the invention to include a fluid and a pump for moving the fluid in the system of Antonov. The motivation would be to be able to use electricity to represent data, as is commonly done in the art.

Regarding claim 8, the medium includes electricity and wherein each node includes a transmitter/receiver for flow of the electricity is missing from Antonov. However, Ulug discloses in column 26, lines 40-44, a network that has electricity flowing through it to represent data. It would have been obvious to one skilled in the art at the time of the invention to use electricity in the system of Antonov. The motivation would be to use a well-known type of medium to represent data.

5. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antonov in view of Eslambolchi in further view of Doshi.

Regarding claim 14, nodes can be assigned to sub-rings of any prescribed sizes and regardless of any existing assignments of nodes/links to disjoint sub-rings a new additional sub-ring assignment can be made that is also disjoint from all existing sub-rings without modifying the existing assignments is missing from Antonov. However, Doshi discloses in column 41, line 60, multiple sets of disjoint links and nodes that may be used in the event of failure of a primary node. It would have been obvious to one skilled in the art to have multiple disjoint subrings in the system of Antonov. The motivation would be to improve restoration response in the system.

Regarding claim 15, nodes can be assigned to sub-rings of any prescribed sizes and regardless of any existing assignments of nodes/links to disjoint sub-rings a new additional sub-ring assignment can be made that is also disjoint from all existing sub-

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rings with only a specified upper-bounded modification of the existing assignments is missing from Antonov. However, Doshi discloses in column 30, lines 43-45, a system that calculates all disjoint routes (subrings) that may be used in the event of failure, which would include the additional subrings created by the new assignment and upper bound modification. It would have been obvious to one skilled in the art at the time of the invention to calculate all the possible subrings in the system in the event of failure and choose the optimum ones, modifying existing assignments if necessary. The motivation would be to optimize restoration in the network.

Regarding claim 16, nodes can be assigned to sub-rings of any prescribed sizes according specified criterion regarding the impact on existing assignments nodes/links relative to new additional assignments the presence of some specified number of faulty nodes/links is missing from Antonov. However, Doshi discloses in column 30, lines 20-47, picking out of a set of disjoint backup paths (groups) the ones with capacity to reroute traffic in a failure condition; the selected paths are chosen in a manner that takes into account the impact of using them as a restoration route on the primary traffic they are already receiving from other groups they are in. It would have been obvious to one skilled in the art at the time of the invention to assign the nodes taking into account impact on other nodes/links in the event of a failure, as is done in Doshi, in the system of Antonov. The motivation would be to ensure sufficient transport capacity for both primary and restoration traffic (see Doshi, column 30, line 31, choosing routes with minimum capacity).

6. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antonov in view of Eslambolchi.

Regarding claim 17, a recursive construction of the network as described in Claim 5 wherein each node in a core ring unto itself represents an embedded network as described in Claim 5 is not specifically disclosed in Antonov. However, Antonov does disclose in column 3, lines 55-65, that all the rings, (which may be as many rings as is desired) are interconnected, which causes the rings to be connected in a ring topology, resulting in a recursive construction. It would have been obvious to one skilled in the art at the time of the invention to expand the network of Antonov and connect the rings into further rings. The motivation would be to fully interconnect all pairs of rings (Antonov, column 3, lines 64-65).

Regarding claim 18, a concatenated network comprised of the networks as described in Claim 5 wherein the nodes of the core rings of the comprising networks also have spanning links to the nodes of other networks as described in Claim 5 according to specified binding patterns regarding network to network coverage and reachability is not specifically disclosed in Antonov. However, Antonov does disclosed in column 3, lines 55-65, that all the rings are interconnected so that all the nodes are reachable from one another. It would have been obvious to one skilled in the art at the time of the invention to span the nodes so as to make the nodes reachable. The motivation would be to fully interconnect the network (Antonov, column 3, lines 64-65).

7. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Antonov in view of Eslambolchi in further view of Moiin. The each node is associated with at

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least one other node which can serve as a back-up node regarding network reconfiguration so as to tolerate link and/or node failures is missing from Antonov. However, Moin discloses in column 14, lines 39-40, a network with backup nodes. It would have been obvious to one skilled in the art at the time of the invention to include backup nodes in the system of Antonov. The motivation would be to have a backup in event of failure (Moin, column 14, lines 45-47).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia L. Davis whose telephone number is (571) 272-3117. The examiner can normally be reached on 8:30 to 6, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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